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Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
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Jawaharlal Nehru
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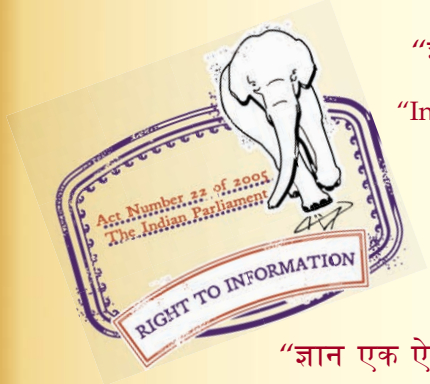
IS 10407 (1998): Automotive vehicles - Two wheelers - Acceleration peformance - Method of Evaluation [TED 4: Automotive Braking Systems]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 10407 : 1998

भारतीय मानक

(Reaffirmed 2003)

स्वचल वाहन — दुपहिए — त्वरण कार्यकारिता — मूल्यांकन पद्धति

(दूसरा पुनरीक्षण)

Indian Standard

AUTOMOTIVE VEHICLES — TWO WHEELERS — ACCELERATION PERFORMANCE — METHOD OF EVALUATION

(Second Revision)

ICS 43.040.30; 43.140

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1998

Price Group 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Vehicles Testing and Performance Evaluation Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1983 and it was revised in 1994 to incorporate the methods of computing acceleration of two wheelers, that is, time taken from start to cover a fixed distance. The present revision has been undertaken to include the following three methods presently being used in evaluating acceleration performance of two wheelers. As the present revision covers all types of two wheelers such as scooters, motorcycles and mopeds, it supersedes 'IS 12055 Method of measurement of acceleration of mopeds' that covers exclusively mopeds:

i) Time taken from start to cover a fixed distance.

ii) Time taken from start to attain a given speed.

iii) Time taken to attain a required speed from a lower speed in various gears.

While preparing this standard considerable assistance has been derived from JIS 1035-1975 'Method of acceleration test for motorcycles', issued by Japanese Industrial Standards Committee.

The committee responsible for preparation of this standard is given in Annex A.

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

AUTOMOTIVE VEHICLES — TWO WHEELERS — ACCELERATION PERFORMANCE — METHOD OF EVALUATION

(Second Revision)

1 SCOPE

This standard specifies the method of evaluation of acceleration performance of two wheelers such as mopeds, scooters and motorcycles.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
4151 : 1993	Protective helmets for motorcycle riders (*third revision*)
9726 : 1984	Terms and definitions of weights of mopeds (*first revision*)
11422 : 1986	Terms and definitions of weights of scooters and motorcycles

3 PREPARATION OF THE VEHICLE

3.1 Prior to testing it shall be ensured that the vehicle shall conform in all its parts, components and systems to the technical specification declared by the manufacturer.

3.2 The fuel and lubricants used, the adjustment of the fuel feed and ignition devices, the viscosity of the oils for moving mechanical parts and the pressure of the tyres shall conform to the instructions specified by the manufacturer of the vehicle.

3.3 The vehicle shall be run-in as per the practice recommended by the manufacturer.

3.4 Before the test, all parts of the vehicle shall be stabilized at the temperature normal for the vehicle in use.

3.5 The unladen weight of the vehicle shall be the vehicle kerb weight in accordance with IS 9726 or IS 11422.

3.6 The tyres shall be run-in with the vehicle and shall have a tread depth not less than 90 percent of the tread depth of a new tyre and shall have operated for at least 500 km or the distance recommended for the running-in of the vehicle, whichever is lower, on the road prior to test.

3.7 The tyre pressure shall be adjusted to the value specified by the manufacturer, when cold and shall not exceed the maximum value specified in the relevant Indian Standard for that size of the tyre.

3.8 The distribution of the load between the wheels shall be as recommended by the manufacturer.

4 REQUIREMENTS OF THE DRIVER

4.1 The driver shall have a mass of 68 to 75 kg and a height of 1.65 to 1.75 m.

4.2 The driver shall wear a well fitting riding suit (one piece) or similar clothing and also a crash helmet conforming to IS 4151.

4.3 He shall be seated on the seat provided for the rider, in upright position. This position shall, nevertheless, allow the rider at all times to have a proper control of the vehicle during the test.

5 FEATURES OF TEST TRACK

5.1 The test shall be carried out on a roadway, clean, smooth, dry, covered with asphalt or a similar material, in a straight line.

5.2 The longitudinal and lateral slope of the test track shall not be more than 0.5 percent and 2 percent respectively. The altitude difference between any two points 1 000 metres apart shall also not be more than

one metre.

6 ATMOSPHERIC CONDITIONS

6.1 The ambient condition at the test site shall be as follows:

i) Atmospheric pressure	86 to 106 kPa
ii) Temperature	288 to 308 K (15 to 35°C)
iii) Relative humidity	75 percent, *Max*

6.2 Air density when calculated as outlined below shall not differ by more than 7.5 percent from the air density under the reference conditions:

$$d_t = \frac{d_o \times P_t \times T_o}{P_o \times T_t}$$

where

d_t = air density at test site expressed in kg/m^3,

d_o = air density at reference conditions in kg/m^3 (1.168 kg/m^3),

P_t = atmospheric pressure at test site in kPa,

P_o = atmospheric pressure at reference condition in kPa (100 kPa),

T_t = ambient temperature at test site K, and

T_o = ambient temperature at reference condition (300 K).

6.3 The wind velocity in any direction shall not exceed 3 m/s. The measurement of wind velocity shall be done at a height of 1 to 1.5 metres above road surface.

7 TEST PROCEDURE

7.1 The engine at the starting point be at the idling rpm as specified by the manufacturer. During testing any device for enrichening the mixture shall be rendered inoperative.

7.2 The test shall be done with single rider. The vehicle weight with rider and instrumentation, if any, shall be within 75 to 80 kg.

7.2.1 If, for any specific purpose, the test is conducted with load conditions other than with single rider, the total weight of the vehicle shall be recorded.

7.3 The rider shall maintain the riding position outlined in **4.3**.

7.4 The throttle opening shall be such as to increase the speed at the shortest duration in different gears.

7.5 The procedure for the measurement of acceleration performance by the following three methods.

7.5.1 *Method* I

Time taken from start to cover a fixed distance.

7.5.1.1 A reference point on the vehicle such as the centre line of the front wheel of the vehicle shall coincide with starting point. The time taken from the moment the vehicle starts moving till reference point on the vehicle passes the end of the measuring strip shall be measured. This shall be carried out in each direction.

7.5.2 *Method* II

Time taken from start to attain a given speed shall be noted. The test may also be conducted for speed starting from 'Zero' and increasing in steps of 10 km/h to the speed indicated below:

Maximum Speed Specified by Vehicle Manufacturer (km/h)	*Time Taken to Achieve a Speed of*
Up to 60	40 km/h or 75 percent of maximum speed rounded off to nearest 5 km/h whichever is lower
60 - 100	60 km/h or 75 percent of maximum speed rounded off to nearest 5 km/h whichever is lower
More than 100	80 km/h

The test shall be repeated in the opposite direction also.

7.5.3 *Method* III

Time taken to attain a required speed from a lower speed, through gears or any one gear.

7.5.3.1 This is applicable only for two wheelers whose maximum speed specified by the vehicle manufacturer exceeds 70 km/h. The vehicle may be driven in any constant speed of 30 km/h and gear recommended by the manufacturer. When the speed becomes steady, accelerate the vehicle fully to attain a speed of 60 km/h through gears, the gear shifting being as recommended by the vehicle manufacturer. The time taken for this shall be noted. Test shall be repeated in opposite direction also.

7.6 The time shall be determined with ± 0.7 percent accuracy.

7.7 The average acceleration performance for the run shall be equal to the arithmetical average of the time taken to cover the measuring strip or to attain a given speed from zero speed or to attain a required speed from a lower speed in each direction.

7.8 This measurement shall be made at least two consecutive times.

8 RESULT OF ACCELERATION PERFORMANCE

8.1 The acceleration performance shall be expressed in seconds rounded off to the nearest two decimals, which corresponds to the arithmetical average of the values of the time measured during the consecutive tests, which do not differ by more than 5 percent.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Automotive Vehicles Testing and Performance Evaluation Sectional Committee, TED 8

Chairman

SHRI R. RAMAKRISHNAN
28, I Cross Road, Kasturi Bai Nagar,
Adyar, Chennai 600020

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(*Continued on page 4*)

(*Continued from page* 3)

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Member Secretary

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Joint Director (Transport Engg), BIS

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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